AMENDMENTS TO THE CLAIMS

Please amend the claims as follows. For claims not marked as amended in this response, any difference in the claims below and the previous state of the claims is unintentional and in the nature of a typographical error.

1. (Previously Presented) Method of estimating an electrical capacitance of a circuit component comprising:

a first rectangular conducting plate, having a width W, a length L and a thickness t_{M1};

a second conducting plate, parallel to the first plate and separated from the latter by a distance t_{Ox}, having a rectangular central part facing the first plate and a peripheral part surrounding said central part;

a first homogeneous dielectric, of relative dielectric permittivity ε_{Ox}, placed between the first and second plates and having a thickness of t_{Ox} between the two plates and of t_{OxSt} in line with said peripheral part of the second plate, so that said first dielectric has a height step $t_{Ox} - t_{OxSt}$ around the perimeter of the first plate; and

a second homogeneous dielectric, of relative dielectric permittivity ε_E, surrounding the first plate and the first dielectric,

the method comprising the estimation of the capacitance of the component as a sum of several terms including at least two terms of the form $C_0.W.L$ and $C_1.2(W+L)$, with

$$C_0 = \frac{\varepsilon_0 \cdot \varepsilon_{Ox}}{t_{Ox}} \text{ and } C_1 = \frac{\varepsilon_0}{\pi} \cdot K \cdot Ln(a),$$

• ε_0 being the dielectric permittivity of free space,

$$\bullet\ K = \frac{\varepsilon_{ox} \cdot \varepsilon_E}{\varepsilon_{ox} - \left(\frac{(\varepsilon_E - \varepsilon_{ox})^2}{(\varepsilon_E + \varepsilon_{ox})} \cdot \frac{t_{oxSt}}{t_{ox}} \right)},$$

$$\bullet\ a = -1 + 2k^2 + 2k\sqrt{k^2 - 1} \text{ with } k = 1 + \frac{t_{M1}}{t_{ox}}.$$

2. (Original) Method according to Claim 1, wherein the terms of the sum furthermore include two terms of the form $[C_2(W)+C_3(W)]\cdot 2L$ and $[C_2(L)+C_3(L)]\cdot 2W$, with, for $x = W$ or L:

$$C_2(x) = \frac{\varepsilon_0}{\pi} \cdot K \cdot \mathrm{Ln}\left(\frac{u(x)}{a}\right) \text{ and}$$

$$C_3(x) = \frac{\varepsilon_0 \cdot \varepsilon_{ox}}{\pi} \cdot \left[2 - \mathrm{Ln}4 - \mathrm{Ln}\left(1 - 2\exp(-2\theta(x))\right)\right],$$

• the quantity $u(x)$ being an estimate of a solution of the equation

$$\frac{\pi}{2}\frac{x}{t_{ox}} = -\frac{a+1}{\sqrt{a}} \ln\left(\frac{R(x)+1}{R(x)-1}\right) + \frac{a-1}{\sqrt{a}} \frac{R(x)}{\left(R(x)^2 - 1\right)} + \ln\left(\frac{R(x)\sqrt{a}+1}{R(x)\sqrt{a}-1}\right) \text{ with}$$

$$R(x) = \sqrt{\frac{u(x) - 1}{u(x) - a}}, \text{ and}$$

$$\bullet\ \theta(x) = 1 + \pi\frac{x}{2t_{ox}}.$$

3-8. (Canceled).

9. (Previously Presented) Method of determining a dimension of a capacitor of electrical capacitance C_u comprising:

a first rectangular conducting plate, having a width W, a length L and a thickness t_{M1};

a second conducting plate, parallel to the first plate and separated from the latter by a distance t_{Ox}, having a rectangular central part facing the first plate and a peripheral part surrounding said central part;

a first homogeneous dielectric, of relative dielectric permittivity ε_{Ox}, placed between the first and second plates and having a thickness of t_{Ox} between the two plates and of t_{OxSt} in line with said peripheral part of the second plate, so that said first dielectric has a height step t_{Ox} - t_{OxSt} around the perimeter of the first plate; and

a second homogeneous dielectric, of relative dielectric permittivity ε_E, surrounding the first plate and the first dielectric,

the method comprising the calculation of a first approximate value L_1 of the length L as a sum of first terms including C_u and at least one term of the form $-2 \cdot C_1 \cdot W$ divided by a sum of second terms including at least two terms of the form $C_0.W$ and $2.C_1$, with $C_0 = \frac{\varepsilon_0 \cdot \varepsilon_{Ox}}{t_{Ox}}$ and

$C_1 = \frac{\varepsilon_0}{\pi}.K.\ln(a)$,

- ε_0 being the dielectric permittivity of free space,

• $K = \dfrac{\varepsilon_{Ox} \cdot \varepsilon_E}{\varepsilon_{Ox} - \left(\dfrac{(\varepsilon_E - \varepsilon_{Ox})^2}{(\varepsilon_E + \varepsilon_{Ox})} \cdot \dfrac{t_{OxSt}}{t_{Ox}} \right)}$,

• $a = -1 + 2k^2 + 2k\sqrt{k^2 - 1}$ with $k = 1 + \dfrac{t_{M1}}{t_{Ox}}$.

10. (Original) Method according to Claim 9, wherein said first terms furthermore include two terms of the form $-2 \cdot C_2(L_0).W$ and $-2.C_3(L_0).W$, L_0 being a defined initial value and wherein said second terms furthermore include two terms of the form $2.C_2(W)$ and $2.C_3(W)$, with for $x = W$ or L_0:

$C_2(x) = \dfrac{\varepsilon_0}{\pi} \cdot K \cdot \ln\left(\dfrac{u(x)}{a}\right)$, and

$C_3(x) = \dfrac{\varepsilon_0 \cdot \varepsilon_{Ox}}{\pi} \cdot [2 - \mathrm{Ln}4 - \mathrm{Ln}(1 - 2\exp(-2\theta(x)))]$,

• The quantity u(x) being an estimate of a solution of the equation :

$\dfrac{\pi}{2} \dfrac{x}{t_{Ox}} = -\dfrac{a+1}{\sqrt{a}} \ln\left(\dfrac{R(x)+1}{R(x)-1}\right) + \dfrac{a-1}{\sqrt{a}} \dfrac{R(x)}{(R(x)^2 - 1)} + \ln\left(\dfrac{R(x)\sqrt{a}+1}{R(x)\sqrt{a}-1}\right)$ with

$R(x) = \sqrt{\dfrac{u(x)-1}{u(x)-a}}$, and

• $\theta(x) = 1 + \pi \dfrac{x}{2t_{Ox}}$.

11-16. (Canceled).

17. (Previously Presented) A method of estimating an electrical capacitance of a circuit component comprising,

a rectangular first conducting plate,

a second conducting plate parallel to the first plate, having a rectangular central part facing the first plate and a peripheral part surrounding said central part,

a first homogeneous dielectric placed between the first and second conducting plates, and

a second homogeneous dielectric surrounding the first conducting plate and the first dielectric,

the method comprising the steps of:

estimating a capacitance of a first partial capacitor formed by the lower surface of the first conducting plate and the central part of the upper surface of the second conducting plate;

estimating a capacitance of a second partial capacitor formed by the sides of the first conducting plate and the peripheral part of the upper surface of the second conducting plate; and

determining an estimated capacitance of the circuit component by summing the estimated capacitances of the first and second partial capacitors.

18. (Previously Presented) The method of Claim 17, further comprising the steps of:

estimating a capacitance of a third partial capacitor formed by a peripheral region of the upper face of the first conducting plate and the peripheral part of the upper surface of the second conducting plate; and

estimating a capacitance of a fourth partial capacitor formed by a peripheral region of the lower face of the first conducting plate and the peripheral part of the upper surface of the second conducting plate,

wherein the step of determining an estimated capacitance of the circuit component further comprises summing the estimated capacitances of the third and fourth capacitances.

19. (Previously Presented) The method of Claim 17, wherein the circuit component is a capacitor, and wherein a first plate of the capacitor comprises the first conducting plate of the circuit component and a second plate of the capacitor comprises the second conducting plate of the circuit component.

20. (Previously Presented) The method of Claim 17, wherein a first electrical signal transmission tracks comprises the first conducting plate of the circuit component and a second electrical signal transmission tracks comprises the second conducting plate of the circuit component.

21. (Previously Presented) The method of Claim 17, wherein a conducting substrate carrying the first and second dielectrics and the first conducting plate comprises the second plate of the circuit component.

22. (Currently Amended) A ~~computer program comprising~~ computer readable medium having stored thereon computer executable instructions for ~~applying~~ performing the method of Claim 17~~, when the program is executed by a computer~~.

23. (Previously Presented) The method of Claim 17, wherein

the first conducting plate has a width W, a length L and a thickness t_{M1},

the second conducting plate is separated from the first conducting plate by a distance t_{Ox},

the first dielectric has a relative dielectric permittivity ε_{Ox} and a thickness of t_{Ox} between the two conducting plates and of t_{OxSt} in line with the peripheral part of the second conducting plate, and

the second dielectric has a relative dielectric permittivity ε_E,

and wherein,

the step of estimating a capacitance of a first partial capacitor comprises calculating $C_0 \cdot W \cdot L$,

the step of estimating a capacitance of a second partial capacitor comprises calculating $C_1 \cdot 2(W+L)$, with

$$C_0 = \frac{\varepsilon_0 \cdot \varepsilon_{Ox}}{t_{Ox}},$$

$$C_1 = \frac{\varepsilon_0}{\pi} \cdot K \cdot Ln(a),$$

Ln denoting the natural logarithm,

ε_0 denoting the dielectric permittivity of free space,

$$K = \frac{\varepsilon_{Ox} \cdot \varepsilon_E}{\varepsilon_{Ox} - \left(\frac{(\varepsilon_E - \varepsilon_{Ox})^2}{(\varepsilon_E + \varepsilon_{Ox})} \cdot \frac{t_{OxSt}}{t_{Ox}} \right)}, \text{ and}$$

$$a = -1 + 2k^2 + 2k\sqrt{k^2 - 1} \text{ with } k = 1 + \frac{t_{M1}}{t_{Ox}}.$$

24. (Previously Presented) The method of Claim 18, wherein

the first conducting plate has a width W, a length L and a thickness t_{M1},

the second conducting plate is separated from the first conducting plate by a distance t_{Ox},

the first dielectric has a relative dielectric permittivity ε_{Ox} and a thickness of t_{Ox} between the two conducting plates and of t_{OxSt} in line with the peripheral part of the second conducting plate, and

the second dielectric has a relative dielectric permittivity ε_E,

and wherein,

the step of estimating a capacitance of a first partial capacitor comprises calculating $C_0 \cdot W \cdot L$,

the step of estimating a capacitance of a second partial capacitor comprises calculating $C_1 \cdot 2(W+L)$,

the step of estimating a capacitance of a third partial capacitor comprises calculating $[C_2(W)+C_3(W)] \cdot 2L$,

the step of estimating a capacitance of a fourth partial capacitor comprises calculating $[C_2(L)+C_3(L)] \cdot 2W$,), with

$$C_0 = \frac{\varepsilon_0 \cdot \varepsilon_{ox}}{t_{ox}},$$

$$C_1 = \frac{\varepsilon_0}{\pi} \cdot K \cdot \mathrm{Ln}(a),$$

$$C_2(x) = \frac{\varepsilon_0}{\pi} \cdot K \cdot \mathrm{Ln}\left(\frac{u(x)}{a}\right),$$

$$C_3(x) = \frac{\varepsilon_0 \cdot \varepsilon_{ox}}{\pi} \cdot \left[2 - \mathrm{Ln}4 - \mathrm{Ln}\left(1 - 2\exp(-2\theta(x))\right)\right],$$

Ln denoting the natural logarithm,

ε_0 denoting the dielectric permittivity of free space,

$$K = \frac{\varepsilon_{ox} \cdot \varepsilon_E}{\varepsilon_{ox} - \left(\frac{(\varepsilon_E - \varepsilon_{ox})^2}{(\varepsilon_E + \varepsilon_{ox})} \cdot \frac{t_{oxSt}}{t_{ox}}\right)},$$

$$a = -1 + 2k^2 + 2k\sqrt{k^2 - 1} \quad \text{with} \quad k = 1 + \frac{t_{M1}}{t_{ox}},$$

$$\theta(x) = 1 + \pi\frac{x}{2t_{ox}}, \text{ and}$$

u(x) being an estimate of a solution of the equation

$$\frac{\pi}{2}\frac{x}{t_{ox}} = -\frac{a+1}{\sqrt{a}}\ln\left(\frac{R(x)+1}{R(x)-1}\right) + \frac{a-1}{\sqrt{a}}\frac{R(x)}{\left(R(x)^2-1\right)} + \ln\left(\frac{R(x)\sqrt{a}+1}{R(x)\sqrt{a}-1}\right)$$ with

$$R(x) = \sqrt{\frac{u(x)-1}{u(x)-a}}.$$

25. (Previously Presented) The method of Claim 24, wherein the quantity u(x) is obtained using an iterative method of approximate solution.

26. (Previously Presented) A method of estimating a dimension of a capacitor having a desired electrical capacitance, the capacitor comprising,

a rectangular first conducting plate, having a width,

a second conducting plate parallel to the first plate, having a rectangular central part facing the first plate and a peripheral part surrounding said central part,

a first homogeneous dielectric placed between the first and second conducting plates, and

a second homogeneous dielectric surrounding the first conducting plate and the first dielectric,

the method comprising the steps of:

estimating a capacitance per unit of area of a first partial capacitor formed by the lower surface of the first conducting plate and the central part of the upper surface of the second conducting plate;

estimating a capacitance per unit of length of a second partial capacitor formed by the sides of the first conducting plate and the peripheral part of the upper surface of the second conducting plate; and

determining an estimated length of the first conducting plate, comprising calculating a function of the desired electrical capacitance, the estimated capacitance per unit of area of the first capacitor, the estimated capacitance per unit of length of the second partial capacitor, and the width of the first conducting plate.

27. (Previously Presented) The method of Claim 26, further comprising the steps of:

estimating a capacitance per unit of length of a third partial capacitor formed by a peripheral region of the upper face of the first conducting plate and the peripheral part of the upper surface of the second conducting plate;

estimating a capacitance per unit of length of a fourth partial capacitor formed by a peripheral region of the lower face of the first conducting plate and the peripheral part of the upper surface of the second conducting plate;

selecting an initial estimated length of the first conducting plate; and

determining an estimated length of the first conducting plate, comprising calculating a function of the desired electrical capacitance, the estimated capacitance per unit of area of the first capacitor, the estimated capacitances per unit of length of the second, third and fourth partial

capacitors, the width of the first plate, and the initial estimated length of the first conducting plate.

28. (Previously Presented) The method of Claim 27, wherein the step of determining an estimated length of the first conducting plate is performed iteratively until a desired degree of convergence of the estimated length of the first conducting plate is obtained, and wherein, after the first iteration, the step of determining an estimated length of the first conducting plate comprises calculating a function of the desired electrical capacitance, the estimated capacitance per unit of area of the first capacitor, the estimated capacitances per unit of length of the second, third and fourth partial capacitors, the width of the first plate, and the estimated length of the first conducting plate determined in the previous iteration.

29. (Previously Presented) The method of Claim 28, wherein the initial estimated length of the first conducting plate is selected equal to the width of the first conducting plate.

30. (Previously Presented) The method of Claim 26, wherein

the first conducting plate has a width W and a thickness t_{M1},

the second conducting plate is separated from the first conducting plate by a distance t_{Ox},

the first dielectric has a relative dielectric permittivity ε_{Ox} and a thickness of t_{Ox} between the two conducting plates and of t_{OxSt} in line with the peripheral part of the second conducting plate, and

the second dielectric has a relative dielectric permittivity ε_E,

and wherein,

the step of estimating a capacitance per unit of area of a first partial capacitor comprises calculating $C_0 = \dfrac{\varepsilon_0 \cdot \varepsilon_{Ox}}{t_{Ox}}$,

the step of estimating a capacitance per unit of area of a second partial capacitor comprises calculating $C_1 = \dfrac{\varepsilon_0}{\pi} \cdot K \cdot Ln(a)$,

the step of determining an estimated length of the first conducting plate comprising calculating $\dfrac{C_u - 2 \cdot C_1 \cdot W}{C_0 \cdot W + 2C_1}$, with

Ln denoting the natural logarithm,

ε_0 denoting the dielectric permittivity of free space,

$$K = \frac{\varepsilon_{Ox} \cdot \varepsilon_E}{\varepsilon_{Ox} - \left(\dfrac{(\varepsilon_E - \varepsilon_{Ox})^2}{(\varepsilon_E + \varepsilon_{Ox})} \cdot \dfrac{t_{OxSt}}{t_{Ox}} \right)}, \text{ and}$$

$$a = -1 + 2k^2 + 2k\sqrt{k^2 - 1} \quad \text{with} \quad k = 1 + \frac{t_{M1}}{t_{Ox}}.$$

31. (Previously Presented) The method of Claim 26, wherein

the first conducting plate has a width W and a thickness t_{M1},

the second conducting plate is separated from the first conducting plate by a distance t_{Ox},

the first dielectric has a relative dielectric permittivity ε_{Ox} and a thickness of t_{Ox} between the two conducting plates and of t_{OxSt} in line with the peripheral part of the second conducting plate, and

the second dielectric has a relative dielectric permittivity ε_E,

and wherein,

the step of estimating a capacitance per unit of area of a first partial capacitor comprises calculating $C_0 = \frac{\varepsilon_0 \cdot \varepsilon_{Ox}}{t_{Ox}}$,

the step of estimating a capacitance per unit of area of a second partial capacitor comprises calculating $C_1 = \frac{\varepsilon_0}{\pi} \cdot K \cdot Ln(a)$,

the step of estimating a capacitance per unit of area of a third partial capacitor comprises calculating $C_2(x) = \frac{\varepsilon_0}{\pi} \cdot K \cdot Ln(\frac{u(x)}{a})$,

the step of estimating a capacitance per unit of area of a third partial capacitor comprises calculating $C_3(x) = \frac{\varepsilon_0 \cdot \varepsilon_{Ox}}{\pi} \cdot [2 - Ln4 - Ln(1 - 2\exp(-2\theta(x)))]$,

the step of determining an estimated length of the first conducting plate comprises calculating $\frac{C_u - 2W \cdot (C_1 + C_2(L_0) + C_3(L_0))}{C_0 \cdot W + 2C_1 + 2(C_2(W) + C_3(W))}$, with

L_0 denoting the initial estimated length of the first conducting plate,

Ln denoting the natural logarithm,

ε_0 denoting the dielectric permittivity of free space,

$$K = \frac{\varepsilon_{ox} \cdot \varepsilon_E}{\varepsilon_{ox} - \left(\frac{(\varepsilon_E - \varepsilon_{ox})^2}{(\varepsilon_E + \varepsilon_{ox})} \cdot \frac{t_{oxSt}}{t_{ox}}\right)},$$

$$a = -1 + 2k^2 + 2k\sqrt{k^2 - 1} \text{ with } k = 1 + \frac{t_{M1}}{t_{ox}},$$

$$\theta(x) = 1 + \pi\,\frac{x}{2t_{ox}}, \text{ and}$$

u(x) being an estimate of a solution of the equation

$$\frac{\pi}{2}\frac{x}{t_{ox}} = -\frac{a+1}{\sqrt{a}}\ln\left(\frac{R(x)+1}{R(x)-1}\right) + \frac{a-1}{\sqrt{a}}\frac{R(x)}{(R(x)^2-1)} + \ln\left(\frac{R(x)\sqrt{a}+1}{R(x)\sqrt{a}-1}\right) \text{ with}$$

$$R(x) = \sqrt{\frac{u(x)-1}{u(x)-a}}.$$

32. (Previously Presented) The method of Claim 31, wherein the quantity u(x) is obtained using an iterative method of approximate solution.

33. (Previously Presented) The method of Claim 32, wherein the step of determining an estimated length of the first conducting plate is performed iteratively until a desired degree of convergence of the estimated length of the first conducting plate is obtained, and wherein, after the first iteration, the step of determining an estimated length of the first plate comprises calculating $\frac{C_u - 2W\cdot(C_1 + C_2(L_{i-1}) + C_3(L_{i-1}))}{C_0 \cdot W + 2C_1 + 2(C_2(W) + C_3(W))}$, with L_{i-1} denoting estimated length of the first conducting plate determined in the previous iteration.

34. (Currently Amended) A ~~computer program comprising~~ computer readable medium having stored thereon computer executable instructions for ~~applying~~ performing the method of Claim 26~~, when the program is executed by a computer~~.

35. (Previously Presented) A method of simulating the electrical behavior of an electronic circuit comprising a circuit component, the circuit component comprising

a first rectangular conducting plate,

a second conducting plate parallel to the first plate, having a rectangular central part facing the first conducting plate and a peripheral part surrounding said central part,

a first homogeneous dielectric placed between the first and second conducting plates, and

a second homogeneous dielectric surrounding the first conducting plate and the first dielectric,

the method comprising the steps of:

estimating a capacitance of a first partial capacitor formed by the lower surface of the first conducting plate and the central part of the upper surface of the second conducting plate;

estimating a capacitance of a second partial capacitor formed by the sides of the first conducting plate and the peripheral part of the upper surface of the second conducting plate; and

determining an estimated capacitance of the circuit component by summing the estimated capacitances of the first and second partial capacitors.

36. (Previously Presented) The method of Claim 35, further comprising the steps of:

estimating a capacitance of a third partial capacitor formed by a peripheral region of the upper face of the first conducting plate and the peripheral part of the upper surface of the second conducting plate; and

estimating a capacitance of a fourth partial capacitor formed by a peripheral region of the lower face of the first conducting plate and the peripheral part of the upper surface of the second conducting plate,

wherein the step of determining an estimated capacitance of the circuit component further comprises summing the estimated capacitances of the third and fourth capacitances.

37. (Previously Presented) The method of Claim 35, wherein the electronic circuit further comprises a conducting substrate parallel to the second conducting plate and wherein the

second dielectric is further placed between the second conducting plate and the conducting substrate, the method further comprising the steps of:

estimating a capacitance of a third partial capacitor formed by the lower surface of the second conducting plate and the central part of the upper surface of the conducting substrate;

estimating a capacitance of a fourth partial capacitor formed by the sides of the second conducting plate and the peripheral part of the upper surface of the conducting substrate; and

determining an estimated substrate interaction capacitance between the circuit component and the conducting substrate by summing the estimated capacitances of the third and fourth partial capacitors.

38. (Previously Presented) The method of Claim 37, further comprising the steps of:

estimating a capacitance of a fifth partial capacitor formed by a peripheral region of the upper face of the second conducting plate and the peripheral part of the upper surface of the conducting substrate; and

estimating a capacitance of a sixth partial capacitor formed by a peripheral region of the lower face of the second conducting plate and the peripheral part of the upper surface of the conducting substrate,

wherein the step of determining an substrate interaction capacitance between the circuit component and the conducting substrate further comprises summing the estimated capacitances of the fifth and sixth capacitances.

39. (Previously Presented) The method of Claim 35, wherein the electronic circuit further comprises

a conducting substrate parallel to the second conducting plate,

a third homogeneous dielectric placed between the second conducting plate and the conducting substrate, and

a fourth homogeneous dielectric surrounding the second conducting plate and the first dielectric,

the method further comprising the steps of:

estimating a capacitance of a third partial capacitor formed by the lower surface of the second conducting plate and the central part of the upper surface of the conducting substrate;

estimating a capacitance of a fourth partial capacitor formed by the sides of the second conducting plate and the peripheral part of the upper surface of the conducting substrate; and

determining an estimated substrate interaction capacitance between the circuit component and the conducting substrate by summing the estimated capacitances of the third and fourth partial capacitors.

40. (Previously Presented) The method of Claim 39, further comprising the steps of:

estimating a capacitance of a fifth partial capacitor formed by a peripheral region of the upper face of the second conducting plate and the peripheral part of the upper surface of the conducting substrate; and

estimating a capacitance of a sixth partial capacitor formed by a peripheral region of the lower face of the second conducting plate and the peripheral part of the upper surface of the conducting substrate,

wherein the step of determining an substrate interaction capacitance between the circuit component and the conducting substrate further comprises summing the estimated capacitances of the fifth and sixth capacitances.